

## DETAILED ACTION

### ***Status of the application.***

*Arguments file on 08/24/10*

*Claims are as filed on 01/21/2010*

*There is No New or Amended Claims.*

*Claims 1, 5-10 are presented for examination*

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

### ***Claim Rejections - 35 USC § 103***

1. **Claims 1, 5-10** are rejected under 35 U.S.C. 103(a) as being unpatentable over Roewer et al. (US5,716,590), in view of Manogue et al.(US6,548,720) and Berty (US5,021,383)
2. **Regarding claim 1.** Roewer(590) discloses a process for catalytic hydrodehalogenation of a halogen-containing compound of carbon or silicon such as silicon tetrachloride to trichlorosilane in the presence of hydrogen with a catalyst system comprising of silicon and at least one transition metal or salt of the metal (col 4, line 65) at a temperature sufficient to induce catalytic hydrodehalogenation in a range of 300 to 1000C (col1, line 45-60 and col4, line 40).The active system comprises ceramic carriers or supports such as SiO<sub>2</sub>, zeolites (Col5, line 22, 35). He does not disclose a catalyst system comprising elements of group 2 of the periodic table. Manogue et al. (720) discloses a hydrodehalogenation catalyst with also transition metals and other

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components, some of which are considered to improve the activity and/or the longevity of the catalyst composition such as barium. The catalyst may be supported or unsupported and the supports of fluorides of metals of group IIB are preferred, especially calcium. (Col 3, line 9, line 30, line 37). Berty (383) discloses a catalyst wherein the catalytic active material, also transition metals in combination with alkali or alkali-earth carbonates (salts) is used to convert the toxic chlorocarbons to non-toxic products, especially the salt (Carbonates, bicarbonates) not only act as a dispersing media or a carrier but also react with hydrogen chloride, a by-product of the reaction to form the chloride salt or the alkali part of the carbonates. The catalyst is supported on glass wool ( Col2, line65, Col3, line 20-45, col 4, line 28). The subject matter as a whole would have been obvious for one of ordinary skill in the art at the time of the invention to improve Roewer's catalyst with both teachings of Manogue and Berty of a catalyst comprising alkaline earth metals and their salts (the elements of the Group II in the periodic table) which improve the activity and longevity of the catalyst composition, especially knowing that the by- product of preparing  $\text{HSiCl}_3$  from  $\text{SiCl}_4$  in the presence of hydrogen is HCl therefore the alkali earth metal or its salts would form chloride salt of the alkali therefore converting to non toxic materials.

3. Regarding claim 5. Roewer (590) discloses an atomic ratio of metal (catatyst component) to be 100:1 to 1:100 (col 2, line 18). Manogue discloses a weight ratio of 1 to 20 %wt. (Col3, line 45). The claim of 0.1 to 10 % by wt is within the disclosed range therefore encompassed.

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4. Regarding claim 6. Roewer teaches a 1 to 20 molecules of H<sub>2</sub> are used per halogen atom. (Col2, line53).

5. Regarding claim 7. Rower discloses the reaction can be carried in a trough-flow apparatus. (Col 2, line 62). Manogue teaches that any type of reactors can be used (col 7, line 25) and the claimed of a fixed –bed reactor, a fluidized-reactor or a moving-bed reactor are within the disclosures of both Roewer and Manogue (Corbin, Col 5, ln. 28-35).

6. Regarding claim 8. Roewer discloses the catalytic reaction is carried out at a temperature in the range from 300-1000C and at 1 atm or 0.98 bar (Roewer, Col 2, ln 57-62, and Col 3, ln46-58). Pressure and temperature are effective variables which can be optimized and the subject matter as a whole would have been obvious to one of ordinary skill in the art at the time of the invention to select the portion of the prior art range which is within the range of the applicant claims because it has been held prima facie case of obviousness to select a value in a known range by optimization for the results. In *re Boesch*, 205 USPQ 215, in *re Malagari*, 182 USPQ 549. It would have been obvious to one of ordinary skill in the art to optimize these conditions through routine experimentation in order to obtain the best results.

7. Regarding claim 9. Roewer discloses that “ *the optimum temperature thereby naturally varies for individual compounds, and also depends on process parameters, e.g. on the space velocity with respect to the catalyst*” (Col 3, ln47-52) and the optimum process parameters can be determined by small-scale tests such as temperature and space velocity (Col3 line 554-56). Despite that space velocity is not disclosed, it would have been obvious to one of

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ordinary skill in the art at the time of the invention to choose the instantly claimed ranges through process optimization, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. See in *re Boesch*, 205 USPQ 215. And with known temperature and pressure ranges, velocity can be determined with optimization and experimentations.

8. Regarding claim 10. Roewer in view of Manogue and Berty disclose a process as claim 1 wherein trichlorosilane is isolated from the product mixture.

### ***Response to Arguments***

Applicant's arguments filed 08/24/2010 have been fully considered and they are persuasive therefore previous grounds of rejections are withdrawn. However the claims remain rejected with new arts as stated.

### **Conclusion**

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to COLETTE NGUYEN whose telephone number is (571)270-5831. The examiner can normally be reached on Monday-Thursday, 10:00-4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Curt Mayes can be reached on (571)-272-1234. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/COLETTE NGUYEN/  
Examiner, Art Unit 1793

November 5, 2010

/Melvin Curtis Mayes/  
Supervisory Patent Examiner, Art Unit 1732